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IS 7491 : 1989
( Reaffirmed 1998 )

*Indian Standard*

# SEWING MACHINES, HOUSEHOLD — ACCURACY REQUIREMENTS

## *( First Revision )*

UDC 687·053 : 621·753·1

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**BUREAU OF INDIAN STANDARDS**
**MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG**
**NEW DELHI 110002**

*January* **1990** **Price Group 2**

Sewing Machines Sectional Committee, LMD 18

## FOREWORD

This Indian Standard ( First Revision ) was adopted by the Bureau of Indian Standards on 15 June 1989, after the draft finalized by the Sewing Machines Sectional Committee had been approved by the Light Mechanical Engineering Division Council.

This standard was originally issued in 1974 with a view to establish the quality and durability of sewing machine for household purposes.

This revision incorporates the following modifications in respect of assembly clearance which are felt necessary as a result of experience gained in manufacture and test:

a) Deletion of needle and shuttle clearance test,

b) Deletion of wobbling test,

c) Increase in value in respect of eccentricity of flywheel, and

d) Change in indication position and measurement criteria in respect of shuttle.

The other standards in this series are:

IS 7492 : 1989 Sewing machines, household — Sewing requirements
IS 7493 : 1989 Sewing machines, household — Durability requirements

# *Indian Standard*

# SEWING MACHINES, HOUSEHOLD — ACCURACY REQUIREMENTS

## *( First Revision )*

## 1 SCOPE

**1.1** This standard covers the accuracy requirements for sewing machines for household purposes.

## 2 ACCURACY REQUIREMENTS

### 2.1 Functional Dimensions

Clearances and heights at various points on the machine shall be as follows:

| *Sl No.* | *Item* | *Measuring Dimension* | *Measuring Condition* | *Reference to Fig.* | *Standard Assembly Dimension* mm |
|---|---|---|---|---|---|
| 1) | Feed dog | Height of feed dog teeth from needle plate | Feed dog raised to its highest position | 1 | 1·0, *Max* |
| 2) | Shuttle and shuttle driver | Clearance between heel of shuttle and corresponding tip of shuttle driver | Shuttle heel at bottommost position | 2 | 0·25, *Min*<br>0·50, *Max* |
| 3) | Presser foot | Gap between presser foot and needle plate | Presser foot in lifted condition | 3 | 5·0, *Min* |

### 2.2 Assembly Clearance

The assembly clearances on the machine at various points shall meet the following requirements:

| *Sl No.* | *Item* | *Measuring Condition* | *Measuring Direction* | *Indicator Position* | *Reference to Fig.* | *Maximum Assembly Clearance* mm |
|---|---|---|---|---|---|---|
| 1) | Needle bar | Needle bar at lowermost position | a) In the direction of motion | Top of needle bar | 4A | 0·1 |
| | | | b) At right angle to the direction of motion | Near the bottom of needle bar | 4B and 4C | 0·1 |
| 2) | Thread take up lever | Thread take up lever at top and intermediate position | a) In the direction of motion | Around thread hole | 5A | 0·5 |
| | | | b) At the right angle to the direction of motion | | 5B | 0·5 |
| 3) | Shuttle | a) Tip of pin at topmost/bottommost position of needle bar | Along the axis of pin | Tip of shuttle pin | 6 | 0·07 |
| | | b) Difference between two indicator readings when needle bar is at its highest and lowest position | Along the axis of pin | | — | 0·03 |

| *Sl No.* | *Item* | *Measuring Condition* | *Measuring Direction* | *Indicator Position* | *Reference to Fig.* | *Maximmm Assembly Clearance* mm |
|---|---|---|---|---|---|---|
| 4) | Arm shaft | At different flywheel position (turn flywheel by hand) axial push/pull to be given | Axial direction | Face of the rim of flywheel | 7 | 0·07 |
| 5) | Flywheel | Rotate flywheel to measure eccentrity | Radially | Face of rim of flywheel | 8 | 0·2 |
| 6) | Feed section | At its highest position above needle plate | In the direction of motion | Front edge of the feed dog | 9 | 0·35 |

## 3 METHOD OF TEST

**3.1** The methods for carrying out various accuracy tests are given in Annex A.

# ANNEX A

( *Clause* 3.1 )

## METHODS OF TESTS

### A-1 FEED DOG HEIGHT

**A-1.1** For measurement of feed dog height, the flywheel shall be rotated so as to bring the feed dog to its highest position above the needle plate. The dial indicator shall be so set as to accommodate both the top of the feed dog as well as the needle plate surface within its range. At this position, two readings shall be taken, one at the top of the feed dog and the other at the needle plate surface. The difference between these two observations shall indicate the maximum height of the feed dog above the needle plate ( *see* Fig. 1 ).

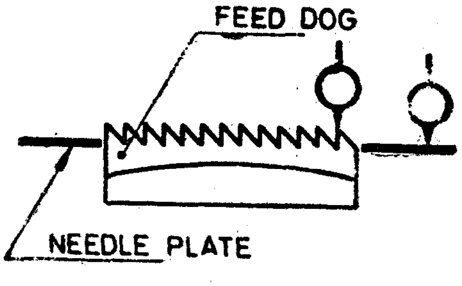

FIG. 1

### A-2 SHUTTLE AND SHUTTLE DRIVER CLEARANCE

**A-2.1** For measurement of this clearance, the machine shall be held in inclined position. The flywheel should be rotated while observing the relative position of the shuttle and its driver till the shuttle heel comes to the bottommost position. At this stage, the measurement for clearance between the heel of the shuttle and the corresponding tip of the shuttle driver shall be made using a feeler gauge. This clearance indicates the clearance existing between the shuttle and the shuttle driver ( *see* Fig. 2 ).

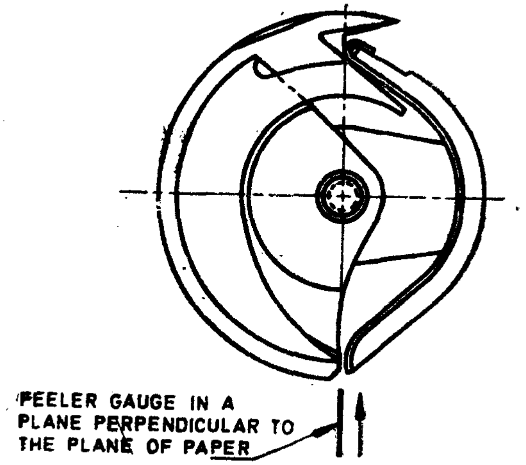

FIG. 2

### A-3 PRESSER FOOT GAP

**A-3.1** For measurement of this gap, the presser foot shall be lifted to its highest position. The gap between the bottom face of the presser foot and the surface of the needle plate shall be measured with a suitable gauge. This gap is an indication of the maximum clearance available between the presser foot and the needle plate of a sewing machine ( *see* Fig. 3 ).

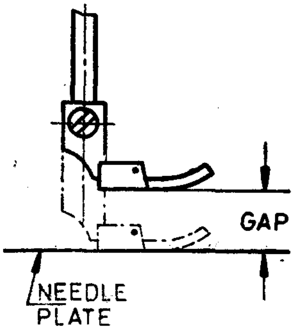

FIG. 3

## A-4 NEEDLE BAR

**A-4.1** Move the needle bar to its lowest position. Place the dial indicator on top of the needle bar using an extension piece, if necessary. Apply light hand pressure at the bottom of the needle bar to push it up and note the indicator readings. Similarly, pull the needle bar down with the same pressure and take second indicator reading. The difference between the two readings shows the assembly clearance for needle bar in the direction of motion ( *see* Fig. 4A ).

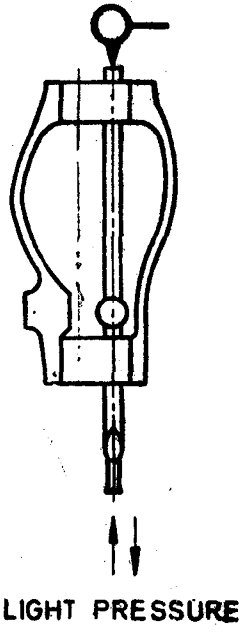

FIG. 4A

**A-4.2** With the needle bar at its lowest position, place the indicator near its lower tip by the side of the bar. Apply sideward light pressure forward and backward. Take one reading of the indicator for each of these two positions. Repeat the test by moving the indicator by 90° and applying the pressure sidewards ( *see* Fig. 4B and 4C ). The difference between the two readings will indicate the assembly clearance for the needle bar in the direction right angle to that of the motion.

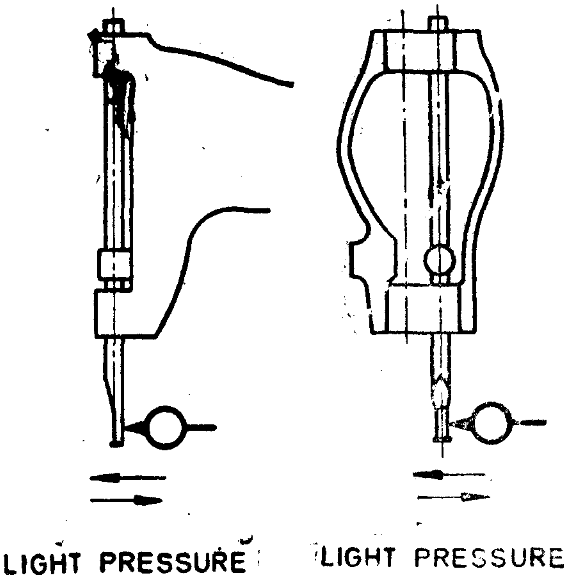

FIG. 4B FIG. 4C

## A-5 THREAD TAKE UP LEVER

**A-5.1** Bring the lever at its top/intermediate/ bottom position. Place the indicator above the lever around thread hole. Pull the lever down with very light hand pressure and note the indicator reading. Similarly, push the lever up with the same pressure and observe the second reading. The difference between the two readings will indicate the clearance in the direction of motion for thread take up lever at its given position ( *see* Fig. 5A ).

**A-5.2** For clearance in the right angle direction, place the indicator on the side wall near the thread hole of the take up lever. Apply very light pressure on the tip of the lever forward and backward and take one reading at each of these positions. The difference between the two readings indicates clearance in the right angle direction ( *see* Fig. 5B ).

## A-6 SHUTTLE

**A-6.1** Set the indicator on top of the shuttle pin in the axial direction. Hold the pin and apply very light axial pull and push and take one reading

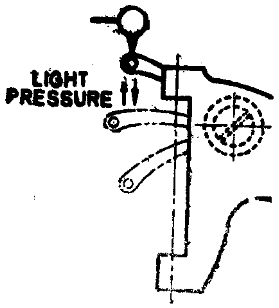

FIG. 5A

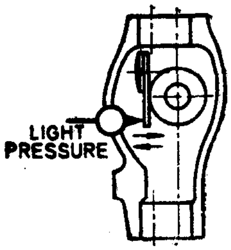

FIG. 5B

each for these two positions. The difference between two readings is an indication of the assembly clearance for the shuttle in the axial direction. An indicator attachment may be necessary for this measurement ( *see* Fig. 6 ).

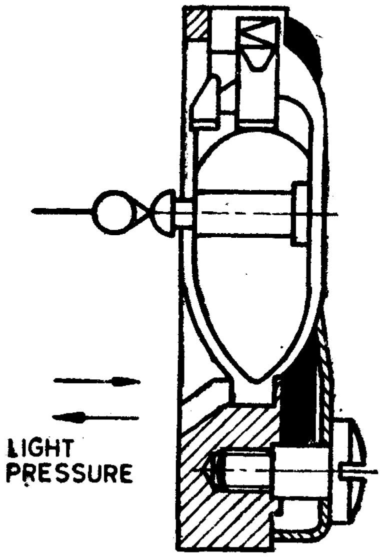

FIG. 6

## A-7 ARM SHAFT

**A-7.1** Place the indicator in contact with the side face of the rim of flywheel at any convenient point. Apply medium hand pressure and pull and push the flywheel in the axial direction of the arm shaft. Take one reading for each of these two positions. The difference between the two readings is an indication of the clearance for the arm shaft in the axial direction ( *see* Fig. 7 ).

## A-8 FLYWHEEL

**A-8.1** For determination of eccentricity of the flywheel, bring the indicator in contact with the circumference of the flywheel. Rotate the flywheel by at least one revolution and note the total difference in indicator reading. This reading will indicate the eccentricity of the flywheel in the radial direction ( *see* Fig. 8)

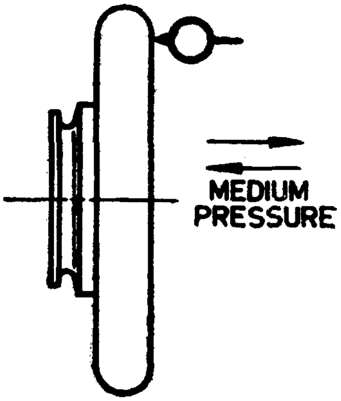

FIG. 7

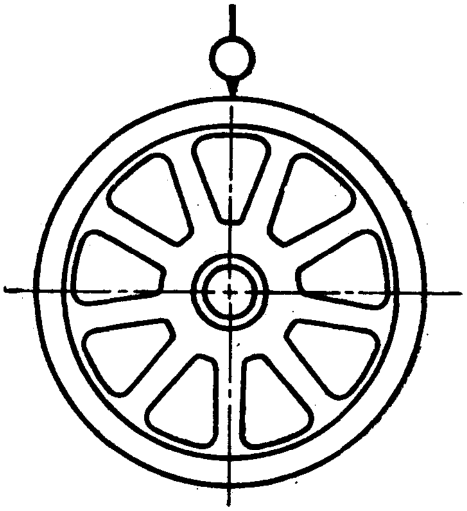

FIG. 8

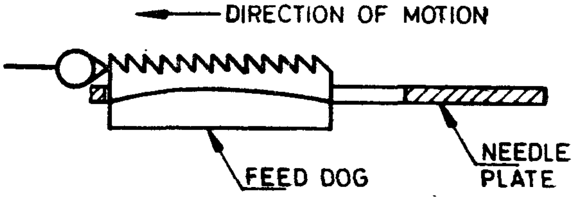

FIG. 9

## A-9 FEED DOG SECTION

**A-9.1** For measurement of feed dog section, the flywheel shall be rotated so as to bring the feed dog to its highter position above the needle plate. The dial indicator shall be set in front edge of the feed dog. The maximum feed amount will be measured with dial indicator in the direction of the motion ( *see* Fig. 9 ).

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